

**BEFORE THE HEARINGS PANEL
FOR THE QUEENSTOWN LAKES PROPOSED DISTRICT PLAN**

IN THE MATTER of the Resource
Management Act 1991

AND

IN THE MATTER of Stage 3b of the
Proposed District Plan

**REBUTTAL EVIDENCE OF ROBERT BOND
ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL**

GEOTECHNICAL ENGINEERING — REZONINGS

RURAL VISITOR ZONE, SETTLEMENT ZONE AND ARTHURS POINT

12 June 2020

 **Simpson Grierson**
Barristers & Solicitors

S J Scott / R Mortiaux
Telephone: +64-3-968 4018
Facsimile: +64-3-379 5023
Email: sarah.scott@simpsongrierson.com
PO Box 874
SOLICITORS
CHRISTCHURCH 8140

CONTENTS

	PAGE
1. INTRODUCTION	1
2. SCOPE.....	1
3. CAREY VIVIAN FOR HERON INVESTMENTS LTD (31014)	1
4. CAREY VIVIAN FOR ROBERT STEWART (31038).....	3
5. MICHAEL LEE FOR CARDRONA VILLAGE LIMITED LTD (31019).....	5

1. INTRODUCTION

1.1 My full name is Robert Bond. My qualifications and experience are set out in my statement of evidence in chief dated 18 March 2020.

1.2 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise except where I state that I am relying on the evidence of another person.

2. SCOPE

2.1 My rebuttal evidence is provided in response to the following evidence filed on behalf of various submitters:

Rural Visitor Zone

(a) Carey Vivian for Heron Investments Ltd (**31014**);

Arthurs Point Rezoning

(b) Carey Vivian for Robert Stewart (**31038**);

Settlement Zone

(c) Michael Lee for Cardrona Village Limited Ltd (**31019**)

3. CAREY VIVIAN FOR HERON INVESTMENTS LTD (31014)

3.1 Mr Vivian has filed planning evidence on behalf of Heron Investments relating to the rezoning to Rural Visitor Zoning sought for their property at Camp Hill Road, Maungawera Valley, Wanaka. As part of his evidence Mr Vivian has presented a Geotechnical Assessment prepared by Mr Grant Meldrum of GDM Consultants, a subsequent letter also prepared by Mr Meldrum and a Geotechnical letter report prepared by Dr Forrest of GCL Ltd addressing the issue of geological faults in the area of the site.

- 3.2** The information compiled by Mr Meldrum presented by Mr Vivian states that *“The now identified fault potentially underlying the property has a very low recurrence interval that would create a low probability of a seismic event, the slip rates across the fault are also very low and the location of the fault is not defined and may not be over the property at all.”*
- 3.3** The subsequent letter report prepared by Dr Forrest concludes that:
- (a) *Application of the MfE’s risk based approach to understanding what are considered allowable buildings within the proposed RVZ indicates that Building Importance category 1, 2a, 2b, 3 and 4 are all permissible.*
 - (b) *It should be stated that the development of any structure within the RVZ should be subject to appropriate and targeted geotechnical investigation and assessment to ensure suitability of foundations and seismic design.*
 - (c) *Based on the review of the available information, GCL is of the opinion that the project site is not at risk from any natural hazard to the extent that it should preclude the rezoning of the site to RVZ in whole or in part.*
- 3.4** I have reviewed the evidence of Mr Vivian and considered the responses supplied by Mr Meldrum and Dr Forrest and I have re-appraised my position with respect to the rezoning of the site.
- 3.5** I accept that the presented information concludes that the main fault trace is most likely not located on the site. In addition, I also accept that the subsidiary fault trace, that is likely to be present below the site, has a revised and much larger recurrence interval (up-to 30,000 years). The information presented also suggests that the slip rates and likelihood of ground rupture is significantly reduced from the original GNS data upon which the Natural Hazards database information is inferred. On this basis I concur with the assessments presented by Mr Meldrum and Dr Forrest that the risk posed to the site associated with the Hāwea – Cardrona Fault trace would most likely be low.
- 3.6** I am therefore of the opinion that the presented information can be relied upon as a detailed assessment of the risks posed by the

identified natural hazard and agree that in accordance with the recommendations of the MfE 2003 guidelines, that the site be considered at a perceived low risk of ground rupture associated with identified fault zones located below the site.

3.7 On the basis of the above I would not oppose rezoning of the entire site to RVZ.

4. CAREY VIVIAN FOR ROBERT STEWART (31038)

4.1 I did not provide evidence in chief relating to the land owned by Mr Robert Stewart located between the Coronet Peak Road turn off and the urban area of Arthurs Point.

4.2 My evidence is provided in response to the evidence of Mr Carey Vivian which attaches and presents the findings of a Preliminary Geotechnical Appraisal for the site prepared by GCL Ltd. I have not completed a site inspection although I am aware of the general conditions and location of the site. The hazard at issue, is landslide.

4.3 I would concur with GCL's preliminary assessment that the risk posed to the site associated with landslide is Moderate to High. It is my opinion that the report produced by GCL presents a reasonable and robust Preliminary Geotechnical Risk Assessment.

4.4 Current best practice in terms of assessing risks posed to property and or site users is to complete a detailed hazard analysis (desk based research and site inspection) followed by detailed site specific investigations in order to determine the actual conditions of the site and then complete a risk assessment in terms of potential cost implications or risk of loss of life. The currently adopted best practice in New Zealand is to complete the assessment using risk-based methodology as defined in the Australian Geomechanics Society guidelines for Landslide Risk Management (AGS 2007).

4.5 Based on the AGS methodology a qualitative assessment of landslide risk posed to this site suggests that the likelihood of an event occurring that could result in property damage is at worst, C – Possible. The

assessment of consequence to property in this instance is considered to be 3: Medium or 2: Major (Appendix C – Qualitative Terminology for use in assessing risk to property, AGS 2007). The resultant Risk Level of a possible event is therefore M-H or Moderate to High. It is therefore my opinion that detailed site investigations would be required in order to determine the stability of the site and suitability for future development as well as to confirm the preliminary assessment of risk.

- 4.6** The information supplied makes reference to previous investigations and assessments of the Coronet Landslide block prepared by Mr Bell of BGL for other land parcels within close proximity to the site. These assessments consider the landslide to be dormant and in a state of equilibrium. Mr Bell is quoted as stating that “*the landslide presents no geotechnical constraint to residential development beyond that of specific design to meet ground conditions and local stability issues*”. In terms of the site specifically, it is the opinion of GCL that extrapolation of the same conclusions of BGL can only be considered preliminary until such times that ground investigation is undertaken to prove the ground conditions and weathering profile are indeed similar. I concur with the precautionary approach.
- 4.7** In considering the results of a preliminary hazard assessment and qualitative risk assessment in terms of the potential future development of the site a *High Risk* is considered to be unacceptable without specific treatment. This work would most likely be of substantial cost. A *Moderate Risk* (subject to regulatory approval) may be tolerated but would most likely require detailed and extensive investigation, planning controls and specialist treatment or monitoring to occur in order to lower the risk.
- 4.8** It is my opinion that the site requires extensive detailed investigations and assessment in order to establish the overall stability and suitability of the site for development. However, I do concur that foundations or other engineering solutions for future developments, whilst not standard, may be achieved that could lower the risk to acceptable levels. The associated cost of achieving these may be prohibitive.

5. MICHAEL LEE FOR CARDRONA VILLAGE LIMITED LTD (31019)

- 5.1** Mr Lee has filed evidence on behalf of Cardrona Village Limited (31019) relating to the rezoning of land in the Cardrona Valley to Settlement Zone (SETZ). As part of his evidence Mr Lee has presented additional flood risk information and his assessment of flooding on areas of the site.
- 5.2** Mr Lee presents flood risk assessment data prepared by Airey Consultants in 2019. The information indicates that the site is affected by flooding in the 1% AEP (100-year event) allowing for climate change increases.
- 5.3** The flood risk assessment considers the sites low lying areas to be flooded up to 500mm during an event. These areas are considered and referenced by Mr Lee to be “ponded areas”.
- 5.4** Mr Lee then describes the proposed mitigation measures of site filling and lifting of ground levels to ensure the development footprint is flood free. I agree with Mr Lee that this is an acceptable means of achieving a flood free development footprint, and that this is commensurate with the requirements of the District Plan to provide a freeboard of 0.5m above the 1%AEP level.
- 5.5** Mr Lee considers the volume of floodplain storage to be very small and will have (*“an insignificant effect on the flood levels within the river and would cause no measurable impact on the flood level of adjacent or upstream and downstream properties”* (at his 25)).
- 5.6** It is my opinion, that in consideration of Mr Lee’s evidence and recently submitted flood risk information, and the PDP Chapter 28 relating to Natural Hazards that:
- (a) The proposal would occur in a logical manner so as to minimise natural hazard risk to the intended development site.

- (b) The risk to people and the built environment posed by natural hazards on the subject site would be managed to a tolerable level.

5.7 However, it is also my opinion that:

- (a) The development proposal would result in a net loss of secondary overland flow paths for the Cardrona River.
- (b) The development proposal would result in a net loss of online flood storage.
- (c) The development proposal would result in an increase in natural hazard risk to adjoining land and downstream developments.

5.8 On this basis I am of the opinion that the requirement of Chapter 28 of the PDP is not satisfied in that the volume of flood risk is small but the impacts of increased velocity, spread and channelization on any development under the SETZ provisions have not been adequately assessed to determine that it is insignificant. Thus it may increase the natural hazard risk to adjoining land and/or downstream developments.

5.9 Without further information pertaining to the quantification or mitigation of risk posed to adjoining land and downstream developments I would, on the basis of flood risk adopt a precautionary approach and oppose the zoning request.



Robert Bond
12 June 2020